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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,488	11/28/2001	Deborah L. Raynes	GB 000169	1434

24737 7590 07/06/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER

QUINONES, ISMAEL C

ART UNIT PAPER NUMBER

2686

5

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/995,488

Applicant(s)

RAYNES ET AL.

Examiner

Ismael Quiñones

Art Unit

2686

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-11 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2 & 4.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Both information disclosure statements (IDS) submitted on January 5th, 2002 and June 24 2002, have being considered by the examiner and made of record in the application file.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Method and Radio System Using Multiple Antennas Simultaneously Operating with Multiple Radio Standards".

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2686

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. **Claims 1-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Paulraj et al. (U.S. Pat. No. 6,067,290) in view of Lehman et al. (U.S. Pat. No. 6,282,184).

Regarding **claim 1**, Paulraj et al. disclose a radio communication system (*Fig. 1A*) having a communication channel (An assigned communication channel of a multiple access protocol; *col. 2, lines 31-36 and lines 53-58*) comprising a plurality of paths between a transmitter and a receiver (*col. 10, lines 59-61; col. 12, lines 39-51; Fig. 3, Fig. 6*) each having a plurality of antennas (*col. 6, lines 7-26; Fig. 3*), wherein the transmitter and receiver are operable according to at least two radio standards (A plurality

of multiple access protocols, such as CDMA, TDMA, FDMA, and SDMA; *col. 7, lines 40-49; col. 5, lines 16-21; Figs. 13A-B*). Paulraj et al. fail to clearly specify wherein the two radio standards are operable simultaneously.

In the same field of endeavor, Lehman et al. disclose a base station transceiver, thereof both transmitter and receiver addressing multiple air interface standards simultaneously (*col. 3, lines 46-50; col. 5, lines 31-33; col. 13, lines 6-7*).

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have Paulraj et al. method and apparatus for spatial multiplexing to simultaneously address multiple radio standards as taught by Lehman et al. for the purpose of creating a cost-effective much simpler transceiver by efficiently reducing redundancy of equipment at the transceiver.

Regarding **claim 2**, Paulraj et al. discloses a transmitter for use in a radio communication system (*Fig. 1A*) having a communication channel (An assigned communication channel of a multiple access protocol; *col. 2, lines 31-36 and lines 53-58*) comprising a plurality of paths between a transmitter and a receiver (*col. 10, lines 59-61; col. 12, lines 39-51; Fig. 3, Fig. 6*) each having a plurality of antennas (*col. 6, lines 7-26; Fig. 3*), wherein means are provided for the operation of the transmitter according to at least two radio standards (A plurality of multiple access protocols, such as CDMA, TDMA, FDMA, and SDMA; *col. 7, lines 40-49; col. 5, lines 16-21; Figs. 13A-B*). Paulraj fail to clearly specify simultaneous operation according to at least two radio standards.

In the same field of endeavor, Lehman et al. disclose a base station transceiver, thereof both transmitter and receiver addressing multiple air interface standards simultaneously (*col. 3, lines 46-50; col. 5, lines 31-33; col. 13, lines 6-7*).

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have Paulraj et al. method and apparatus for spatial multiplexing to simultaneously address multiple radio standards as taught by Lehman et al. for the purpose of creating a cost-effective much simpler transceiver by efficiently reducing redundancy of equipment at the transceiver.

Regarding **claim 3**, and as applied to claim 2, Paulraj et al. in view of Lehman et al. disclose the aforementioned transmitter. In addition both Paulraj et al. and Lehman et al. disclose wherein air interface means are provided for each supported radio standard or protocol (*See Paulraj (U.S Pat. No. 6,067,290), col. 7, lines 40-49; col. 5, lines 16-21; Figs. 13A-B; and Lehman (U.S Pat. No. 6,282,184), col. 5, lines 31-33*).

Regarding **claim 4**, and as applied to claim 2, Paulraj et al. in view of Lehman et al. disclose the aforementioned transmitter. In addition Paulraj et al. suggest wherein each the subscriber and the base station equipped with multiple antennas supporting multiple air interface communication protocols (*col. 5, lines 16-21*), therefore transmitting and receiving data via multiple communication protocols.

Furthermore in the same field of endeavor, Lehman et al. disclose air interface means provided for at least one supported radio standard (CDMA, GSM, etc.) and means provided for transmitting data for a first radio standard via air interface means of a second radio standard (Wherein the base station transceiver comprises a plurality of air

interface means supported by a plurality of radio standards, such as receiving data supported by one of the plurality of radio standards (i.e. CDMA) and transmitting data via another radio standard (i.e. GSM); *col. 2, line 61 thru col. 3, line 19*).

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have Paulraj et al. method and apparatus for spatial multiplexing to simultaneously address multiple radio standards as taught by Lehman et al. for the purpose of addressing data diversity regarding each base station and subscriber unit supported radio standard.

Regarding **claims 5, 6, and 7**, and as each applied to claim 2, Paulraj et al. in view of Lehman et al. discloses the aforementioned transmitter. In addition Paulraj et al. discloses wherein the transmitter further comprises path characterisation means for determining at least one transmission property of each path (Path characterisation means such as separating substreams in accordance to multipath transmissions based on a the bit error rate (BER) of the transmission, thus transmitting the substreams to the corresponding portable unit; *col. 10, lines 59 thru col. 11, lines*), categorisation means for assigning a category to a set of data for transmission and means responsive to said category (Categorisation means wherein certain types of data substreams are categorized in accordance to a low bit rate, QoS and susceptibility to buffering and delayed transmissions, subsequently responsive to certain types of data by deciding to implement spatial multiplexing; *col. 10, lines 2-45*) and said at least one transmission property for determining a coding and mapping to apply to the set of data to the transmitter's antennas (Spatial Multiplexing, wherein after splitting a datastream into substreams and

appropriately routing the substream, logic is applied for mapping the transmitted composite signals or substreams, thus deriving the original datastream; *col. 7, line 40 thru col. 8, line 22; col. 23, lines 54-67*) (claim 5), the categorisation means adapted to assign different categories to respective segments of data from an application depending on at least one of their relative importance, required quality of service, data rate, tolerable transmission delay and tolerable error rate (Wherein Spatial Multiplexing is not applied according to certain types of datastreams which required low bit rate, QoS and susceptibility to buffering and delayed transmissions; *col. 10, lines 2-45*) (claim 6), and the path characterisation means adapted to determine at least one of a delay and a signal-to-noise ratio for each path (*col. 23, lines 54-58; col. 24, line 54 thru col. 25, line 16*) (claim 7).

Regarding **claim 8**, and as applied to claim 2, Paulraj et al. in view of Lehman et al. disclose the aforementioned transmitter. In addition both Paulraj et al. and Lehman et al. disclose a plurality of supported radio standards (CDMA, GSM, TDMA, FDMA, SDMA). Paulraj et al. in view of Lehman et al. fail to clearly specify wherein the supported radio standards include UMTS and HIPERLAN.

However, the examiner takes Official Notice that radio communication standards such as UMTS and HIPERLAN are well known in the art of wireless communications.

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have Paulraj et al. in view of Lehman et al. system for spatial multiplexing operating in two radio standards simultaneously for the purpose of operating in a communication system over widely utilized communication standards.

Regarding **claim 9**, Paulraj et al. disclose a receiver for use in a radio communication system (*Fig. 1A*) having a communication channel (An assigned communication channel of a multiple access protocol; *col. 2, lines 31-36 and lines 53-58*) comprising a plurality of paths between a transmitter and a receiver (*col. 10, lines 59-61; col. 12, lines 39-51; Fig. 3, Fig. 6*) each having a plurality of antennas (*col. 6, lines 7-26; Fig. 3*), wherein means are provided for operation of the receiver according to at least two radio standards (A plurality of multiple access protocols, such as CDMA, TDMA, FDMA, and SDMA; *col. 7, lines 40-49; col. 5, lines 16-21; Figs. 13A-B*). Paulraj et al. fail to clearly specify wherein the operation of the receiver according to at least two radio standards is simultaneous.

In the same field of endeavor, Lehman et al. disclose a base station transceiver, thereof both transmitter and receiver addressing multiple air interface standards simultaneously (*col. 3, lines 46-50; col. 5, lines 31-33; col. 13, lines 6-7*).

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have Paulraj et al. method and apparatus for spatial multiplexing to simultaneously address multiple radio standards as taught by Lehman et al. for the purpose of creating a cost-effective much simpler transceiver by efficiently reducing redundancy of equipment at the transceiver.

Regarding **claim 10**, and as applied to claim 9, Paulraj in view of Lehman et al. disclose the aforementioned receiver. In addition both Paulraj et al. and Lehman et al. disclose wherein air interface means are provided for each supported radio standard or

protocol (*See Paulraj (U.S Pat. No. 6,067,290), col. 7, lines 40-49; col. 5, lines 16-21; Figs. 13A-B; and Lehman (U.S Pat. No. 6,282,184), col. 5, lines 31-33*).

Regarding **claim 11**, Paulraj et al. disclose a method of operating a radio communication system (*Fig. 1A*) having a communication channel (An assigned communication channel of a multiple access protocol; *col. 2, lines 31-36 and lines 53-58*) comprising a plurality of paths between a transmitter and a receiver (*col. 10, lines 59-61; col. 12, lines 39-51; Fig. 3, Fig. 6*) each having a plurality of antennas (*col. 6, lines 7-26; Fig. 3*), the method comprising transmitting according to at least two radio standards. Paulraj et al. fail to clearly specify simultaneously transmitting according to at least two radio standards.

In the same field of endeavor, Lehman et al. disclose a base station transceiver, thereof both transmitter and receiver addressing multiple air interface standards simultaneously (*col. 3, lines 46-50; col. 5, lines 31-33; col. 13, lines 6-7*).

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to have Paulraj et al. method and apparatus for spatial multiplexing to simultaneously address multiple radio standards as taught by Lehman et al. for the purpose of creating a cost-effective much simpler transceiver by efficiently reducing redundancy of equipment at the transceiver.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2686

- a. Paulraj et al. (U.S. Pat. No. 6,351,499), Method and Wireless Systems Using Multiple Antennas and Adaptive Control for Maximizing a Communication Parameter.
 - b. Dajer et al. (U.S. Pat. No. 6,587,448), Reconfigurable Wireless System Base Station.
 - c. Hochwald et al. (U.S. Pat. No. 6,058,105), Multiple Antenna Communication System and Method Thereof.
 - d. Lo et al. (U.S. Pat. No. 6,188,736), Near-Optimal Low-Complexity Decoding of Space-Time Codes for Fixed Wireless Applications.
 - e. Wang et al. (U.S. Pat. No. 6,711,418), Wireless Personal Mobile Data Terminal Receiving a Wide-Area Broadcast and Capable of Two-Way Communication in a Local Area.
 - f. Sugar et al. (U.S. Pat. No. 6,728,517), Multiple-Input Multiple-Output Radio Transceiver.
 - g. Ottersten et al. (U.S. Pat. No. 5,828,658), Spectrally Efficient High Capacity Wireless Communication Systems with Spatio-Temporal Processing.
 - h. Raleigh et al. (U.S. Pat. No. 6,144,711), Spatio-Temporal Processing for Communication.
 - i. Hutchings et al. (U.S. Pat. No. 6,269,252), Programmable Bridging Apparatus to Connect Multiple Networks of Different Protocols.
9. Any response to this Office Action should be **faxed to** (703) 872-9306 or **mailed to:**

Commissioner of Patents and Trademarks

P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Crystal Park II
2021 Crystal Drive
Arlington, VA 22202
Sixth Floor (Receptionist)

10. Any inquiry concerning this communication on earlier communications from the Examiner should be directed to Ismael Quiñones whose telephone number is (703) 305-8997. The Examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm.


11. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marsha D. Banks-Harold can be reached on (703) 305-4379, and fax number is (703) 746-9818. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9301.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose number is (703) 305-4700 or call customer service at (703) 306-0377.

Ismael Quiñones

I.Q.

June 18, 2004


RAFAEL PEREZ-GUTIERREZ
PATENT EXAMINER
6/24/04